

What is claimed is:

1. An agricultural vehicle including an integrated combine reel hydro-mechanical drive system, the drive system being a single integrated hydraulic circuit containing a hydraulic fluid and including a hydraulic reservoir, the single hydraulic circuit comprising:

a hydraulic header circuit connected to the reservoir and supplying hydraulic fluid to activate a steering mechanism; and

a variable pump connected to the reservoir and disposed in the single circuit to pump hydraulic fluid to the header circuit.

2. An agricultural vehicle according to claim 1, wherein the header circuit further comprises an implement circuit supplying hydraulic fluid to an implement valve stack, a steering circuit supplying hydraulic fluid to activate the steering mechanism, and a reel circuit supplying hydraulic fluid to a reel valve stack.

3. An agricultural vehicle according to claim 2, wherein the implement valve stack includes a priority valve that operates to preferentially supply hydraulic fluid to the steering circuit so that the steering circuit maintains the activation of the steering mechanism.

4. An agricultural vehicle according to claim 2, wherein the reel valve stack comprises a first directional valve that operates to supply hydraulic fluid to activate a reel drive and a second directional valve that operates to supply hydraulic fluid to activate a reel positioning mechanism.

5. An agricultural vehicle according to claim 3, wherein the reel valve stack includes a first directional valve that operates to supply hydraulic fluid to activate a reel drive and a second directional valve that operates to supply hydraulic fluid to activate a reel positioning mechanism.

6. An agricultural vehicle according to claim 5, wherein the implement valve stack further includes a third directional valve that operates to supply hydraulic fluid to activate a header adjusting apparatus.

7. An agricultural vehicle according to claim 6, wherein each of the first directional valve, the second directional valve, and the third directional valve is a solenoid operated directional valve.

8. An agricultural vehicle according to claim 2, wherein the header circuit further comprises a load sensing line connected to the steering circuit, the implement valve stack, the reel valve stack, and to the variable pump so that a hydraulic load carried by the header circuit is sensed by the

variable pump, and the variable pump operates to vary the amount of hydraulic fluid pumped in response to the sensed hydraulic load.

9. An agricultural vehicle according to claim 6, wherein each of the first directional valve, the second directional valve, and the third directional valve is a solenoid operated directional valve that is operationally controlled by an on board computer.

10. An integrated combine reel hydro-mechanical drive system for use in an agricultural vehicle, the drive system being a single integrated hydraulic circuit containing a hydraulic fluid and including a hydraulic reservoir, the single hydraulic circuit comprising:

a hydraulic header circuit connected to the reservoir and supplying hydraulic fluid to activate a header implement and a reel of the header implement; and

a variable pump connected to the reservoir and disposed in the single circuit to pump hydraulic fluid to the header circuit.

11. An integrated combine reel hydro-mechanical drive system according to claim 10, wherein the header circuit further comprises an implement circuit supplying hydraulic fluid to an implement valve stack, a steering circuit supplying hydraulic fluid to activate a steering mechanism, and a reel circuit supplying hydraulic fluid to a reel valve stack.

12. An integrated combine reel hydro-mechanical drive system according to claim 11, wherein the implement valve stack includes a priority valve that operates to preferentially supply hydraulic fluid to the steering circuit so that the steering circuit maintains the activation of the steering mechanism.

13. An integrated combine reel hydro-mechanical drive system according to claim 11, wherein the reel valve stack comprises a first directional valve that operates to supply hydraulic fluid to activate a reel drive and a second directional valve that operates to supply hydraulic fluid to activate a reel positioning mechanism.

14. An integrated combine reel hydro-mechanical drive system according to claim 12 wherein the reel valve stack includes a first directional valve that operates to supply hydraulic fluid to activate a reel drive and a second directional valve that operates to supply hydraulic fluid to activate a reel positioning mechanism.

15. An integrated combine reel hydro-mechanical drive system according to claim 14, wherein the implement valve stack further includes a third directional valve that operates to supply hydraulic fluid to activate a header adjusting apparatus.

16. An integrated combine reel hydro-mechanical drive system according to claim 15, wherein each of the first directional valve, the second directional valve, and the third directional valve is a solenoid operated directional valve.

17. An integrated combine reel hydro-mechanical drive system according to claim 11, wherein the header circuit further comprises a load sensing line connected to the steering circuit, the implement valve stack, the reel valve stack, and to the variable pump so that a hydraulic load carried by the header circuit is sensed by the variable pump, and the variable pump operates to vary the amount of hydraulic fluid pumped in response to the sensed hydraulic load.